

Invariant states on the Brown-Glockner-von Waldenfels algebra

UWE FRANZ

Université de Bourgogne Franche-Comté
uwe.franz@univ-fcomte.fr

18 WORKSHOP, BĘDLEWO 2018

Abstract

Denote by $C(U_n^{\text{dual}})$ the universal C^* -algebra generated by the coefficients of a $n \times n$ unitary $U = (u_{jk})_{1 \leq j, k \leq n}$. Voiculescu showed that this algebra can be equipped with the structure of a dual group and Cébron and Ulrich studied its properties from a quantum probabilistic viewpoint, see [CU16, Ulr15] and the references therein. In particular, they defined convolution products associated to the five universal notions of independence (tensor, free, monotone, boolean, and anti-monotone) for states on $C(U_n^{\text{dual}})$. Cébron and Ulrich showed that there exist so-called *tensor and free Haar traces*, i.e. tracial states that are invariant under tensor or free convolution with other tracial states. In my talk I will introduce a family of automorphism groups on $C(U_n^{\text{dual}})$ and I will show that for each of these automorphism groups there exists a tensor and a free Haar KMS-state, i.e. a state satisfying a KMS property that is invariant under tensor or free convolution with any other state satisfying the same KMS property. This leads to a new family of reduced versions of the Brown algebra.

My talk is based on joint work with Guillaume Cébron and Michaël Ulrich.

[CU16] Guillaume Cébron, Michaël Ulrich, Haar states and Lévy processes on the unitary dual group. *J. Funct. Anal.* 270 (2016), no. 7, 2769-2811.

[Ulr15] Michaël Ulrich, Construction of a free Lévy process as high-dimensional limit of a Brownian motion on the unitary group. *Infin. Dimens. Anal. Quantum Probab. Relat. Top.* 18 (2015), no. 3, 1550018.